

## MODULE SPECIFICATION FORM

Module Title:	<b>Electrical and Instrument Systems</b>	Level:	<b>4</b>	Cedit Value:	<b>10</b>
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Module code: (if known)	<b>ENG487</b>	Cost Centre:	<b>GAAE</b>	JACS2 code:	<b>H430</b>
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Semester(s) in which to be offered:	<b>1</b>	With effect from:	<b>July 2015</b>
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<b>Office use only:</b> To be completed by AQSU:	Date approved:	July 2015
	Date revised:	
	Version No:	1

Existing/New:	<b>Existing</b>	Title of module being replaced (if any):	N/A
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Originating Academic area:	<b>Engineering and Applied Physics</b>	Module Leader:	<b>N. Burdon</b>
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Module duration (total hours)	100	Status:	<b>Free-standing 10-credit component comprising second half of ENG463 (Aircraft Systems).</b>
Scheduled learning and teaching hours	36	core/option/elective (identify programme where appropriate):	
Independent study hours	64		
Placement hours	0		

Percentage taught by Subjects other than originating Subject (please name other Subjects):	<b>0%</b>
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<b>Programme(s) in which to be offered:</b>	Pre-requisites per programme (between levels):	<b>None</b>
<b>Enginerig European Programme</b> (Non Award Bearing)		

<b>Module Aims:</b> To develop an understanding of basic electrical power and instrument systems to be used in aeronautical applications.
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<b>Expected Learning Outcomes</b>	
<u>Knowledge and Understanding:</u> At the completion of this module, the student should be able to:	
<ol style="list-style-type: none"> <li>Apply d.c. and a.c. principles to electrical distribution and power systems, identifying individual components and analysing functions.</li> <li>Apply the principles of instrumentation systems and their layouts in practical situations. <i>(KS 5)</i></li> <li>Relate the electrical and instrument systems studied to actual mechanical or aeronautical systems. <i>(KS 1)</i></li> </ol>	
<u>Key skills for employability</u>	
<ol style="list-style-type: none"> <li>Written, oral and media communication skills,</li> <li>Leadership, team working and networking skills</li> <li>Opportunity, creativity and problem solving skills</li> <li>Information technology skills and digital literacy</li> <li>Information management skills</li> <li>Research skills</li> </ol>	<ol style="list-style-type: none"> <li>Intercultural and sustainability skills</li> <li>Career management skills</li> <li>Learning to learn (managing personal and professional development, self management)</li> <li>Numeracy</li> </ol>

**Assessment:**

Please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%). **Details of indicative assessment should also be included.**

Assessment is 100% in-course. The assessment is based on a single case-study to cover all outcomes. For example, the Jet Provost can be investigated so that the student explains the power-distribution system and the pitot-static instrumentation layout, in both cases considering alternatives.  
(This corresponds to 'Assessment 2' of ENG463.)

Assessment number (use as appropriate)	Learning Outcomes to be met	Type of assessment	Weighting	Duration (if exam)	Word count (if coursework)
Assessment One:	1, 2, 3	Case Study	100%		1500

**Learning and Teaching Strategies:**

The module will be presented to students through a specified series of lectures assisted by notes given to the student at the start of each lecture. Practical work will use real-aircraft observation and the use of flight simulators. Where possible, visits to local industries will be arranged to demonstrate actual system operations. Approximately one third of the time will be devoted to practical activity.

**Syllabus outline:**

**Electrical:** Principles and functional consideration of motors/actuators, generators, inverters and transformers; relevant distribution systems (e.g. national, industrial, aircraft or vehicle). Reasons for AC or DC systems and frequency ranges. Power calculations.

**Evaluation:** comparison between hydraulic, pneumatic and electrical systems as power sources (for industry, aircraft or vehicles). Electro-hydraulic and electro-pneumatic applications.

**Instrument systems:** case studies of engine and flight instruments - principles and layouts. The role of computers and networks. Navigation calculations.

*Common*

**Aircraft Systems:** Identification and purpose of airframe components - mainplane, tail/fin; flight controls and control surfaces; power plant; electrical system; flight and engine instrumentation.

**Bibliography**Essential Reading:

Burton M; (2005) *Aircraft Electrical Systems*; Airlife

Moir & Seabridge; (2009) *Aircraft Systems*; Suffolk UK:PEP

Recommended Reading:

Daly S; (2006). *Automotive Air conditioning and Climate Control System*; Oxford UK:Elsevier

Turner I C; (1995). *Engineering Application of Pneumatics & Hydraulics*; Oxford UK:Butterworth Heinemann

Parr EA.; (1999) *Hydraulics & Pneumatics*; Oxford UK:Butterworth Heinemann

Kayton M, Fried W.R.; (2007) *Avionics Navigation Systems*; John Wiley & Sons.

Pallett E H J; (1988) *Aircraft Instruments and Integrated Systems* (4th Ed); Addison Wesley

Burton M; (1997) *Aircraft Systems Volume 3 & 4*; Airlife